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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,377	03/14/2001	Tomas Brodsky	US010059	3327

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EXAMINER	
YODER III, CHRISS S	

ART UNIT	PAPER NUMBER
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/808,377	BRODSKY ET AL.	
	Examiner	Art Unit	
	CHRISS S. YODER III	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-6,12,22-24,30,32-34 and 36-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-6,12,22-24,30,32-34 and 36-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed June 3, 2010 have been fully considered but they are not persuasive.

1. Applicant's arguments with respect to claims 5, 22, and 33, with respect to the extraction of multiple features from each image and matching of the same across different views, have been considered but are moot in view of the new ground(s) of rejection. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

2. Applicant argues, that Suzuki teaches away from providing separate means (e.g., motors) for driving each mirror, and instead teaches that mirror adjustment should be mechanically linked to a mechanism for adjusting stereo base (lateral distance). And that the combination of Zanen and Suzuki would not be obvious because Suzuki teaches away from providing "communication means between the stereo adapter and the camera, [and] a motor for driving each mirror."

However, the Examiner notes that neither Suzuki nor Zanen are considered to require the use of motors to adjust the mirrors, and that both Suzuki and Zanen are considered to adjust the mirrors using a mechanically linked mechanism (Zanen: column 4, line 14 - column 5, line 19). And since Suzuki and Zanen are considered adjust the mirrors using a mechanically linked mechanism, the use of a communication means between the stereo adapter and camera is not required. Therefore, Suzuki's preference to use mechanically linked mechanism instead of a communication means

between the stereo adapter and the camera is not considered to render the combination of Suzuki and Zanen non-obvious.

3. Applicant also argues that the combination of Robinson and Suzuki would not be obvious because Suzuki teaches away from providing "communication means between the stereo adapter and the camera", and since Suzuki teaches away from communication means between the stereo adapter and the camera, the examiner's hypothetical modification of Suzuki to include communication of distance and/or size of an object (e.g., according to Robinson) is counter to Suzuki's disclosure.

However, the Examiner notes that neither Robinson has not been relied upon for the use of any communication between the stereo adapter and the camera, but rather, Robinson was relied upon to teach the use of analyzing image data of different views to match corresponding features and determine focus based on this relationship between matched feaures. Therefore, since the Robinson is not relied upon for communication between the stereo adapter and the camera, Suzuki's preference to not use communication means between the stereo adapter and the camera is not considered to render the combination of Suzuki and Robinson non-obvious.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 3-6, 12, 23-24, 30, 33, 34, and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (US Patent 5,671,450) in view of Zanen (US Patent 5,532,777), and further in view of Robinson (US Patent 4,751,570) and Cox (US Patent 5,383,013).**

5. In regard to **claim 5**, note Suzuki discloses a stereo camera system comprising stereo imaging means for outputting at least one stereo image (column 1, lines 5-11, and figure 1), said stereo imaging means including a camera (column 4, lines 41-45, and figure 1: 1), a set of mirrors angled with respect to each other at an angle relative to a centrally located common plane intersecting said camera, each mirror disposed an adjustable distance from the camera along the common plane, for directing light from an object reflected in said mirrors along a straight line of sight from said mirrors to the camera, for producing a stereo effect in the output of the camera (column 5, lines 15-22, and figure 3: 8L and 8R), adjusting means for automatically changing at least one system parameter which affects the spatial resolution of the object of interest based on the focusing of the camera (column 6, line 49 – column 7, line 12; parameters of the stereo adapter are adjusted in relation to the focusing of the camera), the adjusting means comprising a distance adjustment means for adjusting the distance between the camera and the set of mirrors (column 4, line 59 – column 5, line 8, and figure 6; when the camera is focused/zoomed, the entire stereo adapter is moved along the optical axis), and a focal length adjustment means for changing a focal length of the camera (column 4, lines 41-53). Therefore, it can be seen that Suzuki fails to explicitly disclose the use of a recognition means for analyzing stereo image data from the camera to

locate an object of interest in a field of view of the camera and determine at least one of a distance of the object of interest from the stereo imaging means and a size of the object of interest, wherein said analysis of the stereo image data includes extracting multiple features from each image and matching the multiple features across different views, that the system parameters are changed based on the analysis of the stereo image data at least one of the located distance of the object of interest from the stereo imaging means and the size of the object of interest, and that the adjustment means includes an angle adjustment means for adjusting the angle of the set of mirrors relative to the centrally located plane.

In analogous art, Zanen discloses the use of a stereo imaging adapter having parameters that are adjusted in relation to the focus amount of the camera (column 5, lines 57-67), and the use of an angle adjustment means for adjusting the angle of the set of mirrors relative to the centrally located plane (column 6, lines 16-36, and figures 6-7; the angle between the inner mirrors 16 is adjusted using rod 43 based on the focusing of the lens). Zanen teaches that the use of an angle adjustment means for adjusting the angle of the set of mirrors relative to the centrally located plane is preferred in order to allow for corrections of the field of view (column 5, lines 20-25). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Suzuki device to include the use of an angle adjustment means for adjusting the angle of the set of mirrors relative to the centrally located plane in order to correct of the field of view of the imaging device, as suggested by Zanen.

Also in analogous art, Robinson discloses the use of a recognition means for analyzing stereo image data from the camera to locate an object of interest in a field of view of the camera and determines the distance of the object of interest from the stereo imaging means wherein said analysis of the stereo image data includes extracting multiple features and matching the multiple features across different views (column 2, line 46 – column 3, line 11, when the light spot is projected onto an object, it is considered to create a "feature" that is present in the image data from each of the separate views, i.e., the image data from each view is considered to include a “feature”, then the image data is analyzed such that each of these "features” is extracted from the different views, and by matching these “features” across the different views, the distance to the object can be determined), and changing imaging system parameters based on the distance of the object of interest from the stereo imaging means (column 2, line 46 – column 3, line 11; the determined distance is used to control automatic focusing). Robinson teaches that the recognition of an object of interest by analyzing stereo image data by extracting multiple features and matching the multiple features across different views is preferred in order to accurately detect the object distance, and automatically adjust the focus of a stereo camera system (column 2, line 46 – column 3, line 11). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary reference of Suzuki as modified by Zanen to include the use detection of the distance and/or size of a detected based on the analysis of stereo image data by extracting multiple features and matching the multiple features across different views from the camera in order to accurately detect the object distance, and

automatically adjust the focus of the stereo camera system, as suggested by Robinson. Consequently, the Examiner notes that since the adjustment of the distance between the camera and the set of mirrors disclosed by Suzuki, and the adjustment of the angle of the set of mirrors disclosed by Zanen are both controlled based on the focus adjustment, by modifying the primary reference of Suzuki as modified by Zanen to include the use of focus adjustment based on the detected object distance determined from the analysis of stereo image data, as suggested by Robinson, the adjustment of the angle of the set of mirrors, distance between the camera and the set of mirrors, and the focal length of the camera are considered to be controlled based on the analysis of the stereo image data.

Also in analogous art, Cox discloses the use of stereo vision system that extracts multiple features from each image and matches the multiple features across different views to calculate object distance (column 1, lines 20-37). Cox teaches that the use of stereo vision to extract multiple features from each image and matching the multiple features across different views to calculate object distance instead of a laser is preferred in order to eliminate the need for illuminating the object, and to measure depth across the entire image field rather than simply obtaining a measurement to a single point (column 1, lines 20-37). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary reference to measure the object distance using a stereo vision system that extracts multiple features from each image and matches the multiple features across different views to calculate object distance instead of a laser in order to eliminate the need for illuminating the object, and to measure depth across the

entire image field rather than simply obtaining a measurement to a single point, as suggested by Cox.

6. In regard to **claim 3**, note Suzuki discloses the use of a still camera and the at least one stereo image is a still image (column 1, lines 5-11).

7. In regard to **claim 4**, note Suzuki discloses the use of a video camera and the at least one stereo image is a sequence of video images (column 1, lines 5-11).

8. In regard to **claim 6**, note Robinson discloses the use of a controller for controlling the focus settings based on the signal from the recognition means (column 2, line 46 – column 3, line 11; the stereo image data is analyzed to detect the light spot and determine the object distance and adjust the focus). Suzuki and Zanen control the angle, distance, and focal length based on the focus/zoom settings (Suzuki: column 4, line 41 – column 5, line 8; Zanen: column 5, line 57 – column 6, line 36). Therefore, through the combination of Robinson with Suzuki and Zanen, at least one of the angle, distance, and focal length adjustment means are considered to be controlled based on the signal from the recognition means.

9. In regard to **claim 12**, note Robinson discloses that the recognition means is a stereo vision system (column 2, line 46 – column 3, line 11).

10. In regard to **claim 23**, note Suzuki discloses that the mirrors have adjacent ends positioned at a common point (column 5, lines 4-22, and figure 3: 8L and 8R).

11. In regard to **claim 24**, note Suzuki discloses that the mirrors are disposed for directing the light from the object which is reflected in the mirrors directly from the mirrors to the camera (column 5, lines 15-22).

12. In regard to **claim 30**, note Robinson discloses that the recognition means analyzes the stereo image data during operation of the camera (column 2, line 46 – column 3, line 11; the stereo image data from the camera is used in an auto focus routine).

13. In regard to **claims 33, 34 and 36**, these are method claims, corresponding to the apparatus in claim 5. Therefore, claims 33, 34 and 36 have been analyzed and rejected as previously discussed with respect claim 5.

14. In regard to **claims 37 and 38**, these are method claims, corresponding to the apparatus in claims 23 and 30, respectively. Therefore, claims 37 and 38 have been analyzed and rejected as previously discussed with respect claims 23 and 30.

15. In regard to **claim 39**, note Suzuki discloses that the focal length adjustment is separately adjustable (column 8, line 55 – column 9, line 42; when the zoom lens is limited from being adjusted, and driving motors are used to adjust the stereo base and the convergence angle, the focal length is considered to be independently controlled), and that the distance adjustment means is separately adjustable (column 8, line 55 – column 9, line 42; by using driving motors in the stereo adapter to change the stereo base and the convergence angle, the zoom can be independently controlled without changing the focal length). And Zanen discloses that the angle adjustment means is adjusted separately (column 5, lines 20-39, and column 6, lines 48-57; the angle of the center mirrors can be adjusted independently of distance adjustment and focus adjustment).

16. **Claims 22 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson (US Patent 4,751,570) in view of Cox (US Patent 5,383,013).**

17. In regard to **claim 22**, note Robinson discloses the use of a stereo camera system (column 3, lines 21-24) comprising two video cameras (column 3, lines 21-42; and figure 2: 22), each camera being angled at an angle relative to each other (column 3, lines 43-48) and separated by a distance from each other (column 3, lines 43-48) for outputting a sequence of stereo video images (column 4, lines 10-13), a recognition system which analyzes the stereo video images during operation of the video cameras to output the stereo video images to locate an object of interest in a field of view of the video cameras and determine the distance to the object of interest from the video cameras, wherein said analysis of the stereo video images includes extracting multiple features and matching the multiple features across different views (column 2, line 46 – column 3, line 11, when the light spot is projected onto an object, it is considered to create a "feature" that is present in the image data from each of the separate views, i.e., the image data from each view is considered to include a “feature”, then the image data is analyzed such that each of these "features” is extracted from the different views, and by matching these “features” across the different views, the distance to the object can be determined), and a controller which, based on input from the recognition system, controls a focal length adjustment mechanism which changes a focal length of at least one of the two cameras based on the analysis of the stereo video images (column 3, lines 49-59, and figure 2: 28), an angle adjustment mechanism which adjusts the angle of the video cameras relative to each other based on the analysis of the stereo video

images (column 3, lines 15-48, and figure 2: 28), and baseline adjustment mechanism which adjusts the distance by which the video cameras are separated based on the analysis of the stereo video images (column 3, lines 15-48, and figure 2: 25). Therefore, it can be seen that Robinson fails to explicitly disclose that the feature extraction is performed by extracting multiple features from each image and matching the multiple features across different views.

In analogous art, Cox discloses the use of stereo vision system that extracts multiple features from each image and matches the multiple features across different views to calculate object distance (column 1, lines 20-37). Cox teaches that the use of stereo vision to extract multiple features from each image and matching the multiple features across different views to calculate object distance instead of a laser is preferred in order to eliminate the need for illuminating the object, and to measure depth across the entire image field rather than simply obtaining a measurement to a single point (column 1, lines 20-37). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary reference to measure the object distance using a stereo vision system that extracts multiple features from each image and matches the multiple features across different views to calculate object distance instead of a laser in order to eliminate the need for illuminating the object, and to measure depth across the entire image field rather than simply obtaining a measurement to a single point, as suggested by Cox.

18. In regard to **claim 32**, note Robinson discloses the use of a distance adjusting mechanism which is controlled by the controller to adjust a distance between at least

one of the video cameras and the object of interest (column 2, lines 8-18; the use of zoom is considered to control the distance between the camera and the object).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISS S. YODER III whose telephone number is (571)272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin Ye/
Supervisory Patent Examiner, Art Unit 2622

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Examiner, Art Unit 2622